



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/059,401	01/31/2002	David K. Lambert	DP-301550	6074

7590 04/23/2004

JIMMY L. FUNKE
DELPHI TECHNOLOGIES, INC.
Legal Staff Mail Code CT10C
P.O. Box 9005
Kokomo, IN 46904-9005

EXAMINER

SMITH, RICHARD A

ART UNIT	PAPER NUMBER
----------	--------------

2859

DATE MAILED: 04/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/059,401

Applicant(s)

LAMBERT ET AL.

Examiner

R. Alexander Smith

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-13,15-34,36-43 and 45-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17,31 and 47 is/are allowed.
- 6) ☒ Claim(s) 1,4-13,15,16,18-30,32-34,36-43,45,46 and 48 is/are rejected.
- 7) ☒ Claim(s) 49-51 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1, 5-10, 15, 16, 19, 21-24 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 5,910,659 to Johnson et al. in view of U.S. 4,754,139 to Ennulat et al.

Johnson et al. discloses an infrared generator (figure 3 in view of figure 7), including a transmitter (105), the transmitter defining a perimeter, a frame defining a plurality of reflecting surfaces (210) for reflecting infrared power away from the generator, the reflective surfaces define a light transmitting region (205), each of the reflective surfaces being disposed at an obtuse angle relative to the light transmitting region; a membrane (110) contiguously disposed

on the frame (column 9, lines 32-43 and column 8, lines 37-43) and spanning the light transmitting region for the transmitter being disposed in a central region of the membrane (column 4, lines 65+), the membrane defining membrane borders extending between the perimeter of the transmitter and the plurality of reflecting surfaces, and thermally isolating the generator from the frame, the membrane contiguously disposed on the frame and that thermally isolates the generator, the reflective surfaces define a cavity (125) having a substantially rectangular cross section (column 4, lines 30-39); the frame includes a body for supporting the membrane and the transmitter and a light decorrelator attached to the body, the reflective surfaces (210) being disposed on the light decorrelator (200); the light decorrelator being micromachined silicon (column 4, lines 10-12), and including 1st and 2nd parallel segments, a 3rd segment connected between one end of each 1st and 2nd segments and being at right angles, and a 4th segment connected between the other ends of each 1st and 2nd segment and being at right angles, the 4th segment being parallel to the 3rd segment (column 5, lines 10-12); below a circuit board (column 2, lines 3-10) having a void (125) and the transmitter being disposed adjacent the void; 15 the frame defines a rectangular opening having a perimeter (column 4, lines 30-39), the frame including four segments disposed about the perimeter wherein each segment has an inner side defining one of the reflective surfaces.

Furthermore, Johnson et al. discloses that his infrared generator is not limited to generation but may find application for use in optical signal detection (column 9, lines 55-62).

Johnson et al. does not disclose the infrared generator as an infrared sensor, the transmitter being an absorber to produce a signal representing temperature of a target object, the reflectance of infrared power toward the absorber, the light transmitting region being a light collecting

region, the light decorrelator being a light concentrator, reflective surfaces are coated with a metal film, each segment having a substantially triangular cross section, the inner side extending from adjacent the perimeter of the opening to an apex of the triangular cross section.

Ennulat et al. discloses an infrared sensor wherein the very basic geometric design for each cell is similar to that of the infrared generator of Johnson et al. Ennulat et al. also discloses that the reflective surfaces are coated with a metal film (column 4, lines 51-58 and in particular lines 57-58) and that the segments can have substantially triangular cross sections, the inner side extending from adjacent the perimeter of the opening to an apex of the triangular cross section in order to provide a tight packing of a plurality of said cells. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the infrared generator, taught by Johnson et al, to be an infrared sensor, the transmitter to be an absorber, the reflecting of infrared power away from to be reversed toward the absorber, the light transmitting region to be a light collecting region, and the light decorrelator to be a light concentrator, as suggested by Johnson et al. and as taught by Ennulat et al., in order to provide an infrared sensor that can be manufactured using standard CMOS manufacturing techniques. It also would have been obvious to one of ordinary skill in the art at the time of the invention to add the metal coating and the triangular cross-section, as taught by Ennulat et al., to the reflective surfaces and the segments respectively, taught by Johnson et al., in order to increase the amount of collected radiation that is reflected to the absorber and to allow a denser packing of a plurality of said cells.

3. Claims 4, 20, 33, 34, 36-40, 45 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. and Ennulat et al. as applied to claims 1, 5-10, 15, 16, 19, 21-24 and 28-30 above and further in view of U.S. 6,335,478 to Chou et al.

Johnson et al. and Ennulat et al. teach all that is claimed as discussed in the above rejections of claims 1, 5-10, 15, 16, 19, 21-24 and 28-30 except for the thermocouple being a plurality of series connected thermocouples and each of the thermocouples having a Seebeck voltage which depends upon temperature difference.

Chou et al. discloses a thermocouple being a plurality of series connected thermocouples in order to increase the voltage generated and that each of the thermocouples have a Seebeck voltage which depends upon temperature difference are commonly available (column 1, lines 18-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the thermocouple absorber, taught by Johnson et al. and Ennulat et al., by making it a thermopile using Seebeck voltage, as taught by Chou et al., in order to increase the output voltage and to use commonly available thermocouples to save on costs.

4. Claims 11, 13, 18, 25, 27 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. and Ennulat et al. as applied to claims 1, 5-10, 15, 16, 19, 21-24 and 28-30 above and further in view of U.S. 5,962,854 to Endo.

Johnson et al. and Ennulat et al. teach all that is claimed as discussed in the above rejections of claims 1, 5-10, 15, 16, 19, 21-24 and 28-30 except for a silicon window attached to the frame, extending between the reflective surfaces and enclosing the absorber; the silicon

window extending between the side walls and being parallel to the bottom wall; a silicon window being mounted to the top surfaces of the segments.

Endo discloses that an infrared sensor having a silicon window and an antireflection coating on the window (column 18, lines 3-22) to enclose the area of the thermopile. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the window and the antireflection coating, as suggested by Endo, to the sensor and its top surfaces, extending between the reflective surfaces and to enclose the absorber, taught by Johnson et al. and Ennulat et al., in order to protect the sensor from outside contaminants, to provide a surface for attaching an anti-reflective coating, and to minimize reflections.

5. Claims 41, 43 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al., Ennulat et al. and Chou et al. as applied to claims 4, 20, 33, 34, 36-40, 45 and 46 above, and further in view of U.S. 5,962,854 to Endo.

Johnson et al., Ennulat et al. and Chou et al. teach all that is claimed as discussed in the above rejections of claims 4, 20, 33, 34, 36-40, 45 and 46 except for a silicon window attached to the frame, extending between the reflective surfaces and enclosing the absorber; the silicon window extending between the side walls and being parallel to the bottom wall; a silicon window being mounted to the top surfaces of the segments.

Endo discloses that an infrared sensor having a silicon window and an antireflection coating on the window (column 18, lines 3-22) to enclose the area of the thermopile. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the window and the antireflection coating, as suggested by Endo, to the sensor and its top

surfaces, extending between the reflective surfaces and to enclose the absorber, taught by Johnson et al., Ennulat et al. and Chou et al., in order to protect the sensor from outside contaminants, to provide a surface for attaching an anti-reflective coating, and to minimize reflections.

6. Claims 12 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al., Ennulat et al. and Endo as applied to claims 11, 13, 18, 25, 27 and 32 above, and further in view of U.S. 6,107,925 to Wong.

Johnson et al., Ennulat et al. and Endo together teach all that is claimed as discussed in the above rejections of claims 11, 13, 18, 25, 27 and 32 except for an interference filter.

Wong discloses that an infrared sensor having a window with interference filters in order to allow the band of radiation desired through the window (column 18, lines 28-40). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the interference filter, as suggested by Wong, to the inside of the window, taught by Johnson et al., Ennulat et al. and Endo, in order to allow the bands of radiations desired through the window.

7. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al., Ennulat et al., Chou et al. and Endo as applied to claims 41, 43 and 48 above, and further in view of U.S. 6,107,925 to Wong.

Johnson et al., Ennulat et al., Chou et al. and Endo together teach all that is claimed as discussed in the above rejections of claims 41, 43 and 48 except for an interference filter.

Wong discloses that an infrared sensor having a window with interference filters in order to allow the band of radiation desired through the window (column 18, lines 28-40). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the interference filter, as suggested by Wong, to the inside of the window, taught by Johnson et al., Ennulat et al., Chou et al. and Endo, in order to allow the bands of radiations desired through the window.

Response to Arguments

8. The Applicant's arguments with respect to Ennulat et al., Chou, Endo and Wong, and the suggestions and motivations for the membrane being contiguously disposed on the frame and the membrane borders as amended are moot in view of the new combination.

Allowable Subject Matter

9. Claims 17, 31 and 47 are allowable.

10. Claims 49-51 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

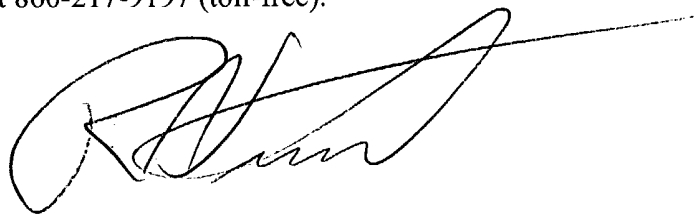
11. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to R. Alexander Smith whose telephone number is 571-272-2251. The examiner can normally be reached on Monday through Friday from 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



R. Alexander Smith
Examiner
Technology Center 2800

RAS
April 19, 2004